

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**THz spectroscopy of spin waves in multiferroic  $\text{LiNiPO}_4$  in high magnetic fields**<sup>1</sup> LAUR PEEDU, T. RÕÕM, J. VIROK, U. NAGEL, NICPB, Tallinn, Estonia, D. SZALLER, S. BORDÁCS, I. KÉZSMÁRKI, BUTE, Budapest, Hungary, D. L. KAMENSKYI, HFML, Radboud Uni., Nijmegen, Netherlands, V. KOCSIS, Y. TOKUNAGA, Y. TAGUCHI, Y. TOKURA, RIKEN, Center for Emergent Matter Science, Japan —  $\text{LiNiPO}_4$  belongs to the family of multiferroic lithium-ortho-phosphates where correlations between magnetic and electric dipoles allow the magnetic control of the electric polarization and electric control of magnetization.  $\text{LiNiPO}_4$  exhibits a very rich phase diagram because of competing magnetic interactions that produce step-like magnetization similar to 2D Ising AFM compounds. We have done THz absorption spectroscopy measurements of  $\text{LiNiPO}_4$  single crystals below 4 K and in magnetic fields up to 33 T. In zero magnetic field we have determined selection rules of magnon excitations by looking at different orientations of the electric and magnetic field components of THz radiation, revealing three magnetic- and three electric-dipole active magnons, and electric-dipole active double-magnon. Between 0 to 33 T along the easy axis we have identified four different phases where magnon modes at phase boundaries are discontinued.

<sup>1</sup>Research sponsored by the Estonian Ministry of Education and Research (IUT23-3) and Estonian Ministry of Education and Research and the European Regional Development Fund project TK134.

Laur Peedu  
National Inst. of Chem. Phys. & Biophys., Tallinn, Estonia

Date submitted: 11 Nov 2016

Electronic form version 1.4